

Professor J B S Haldane
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Dear Jack:

Just as I started to write this letter I realized there might have been a substantial connection between its import and the occasion of my visit to you November 6, 1957. I recall this was the night of a lunar eclipse, and there was also some excitement about the expectation that there might be a demonstration moonshot marked by the deposit of some visible powder! It must have been around this time surely that I began to think of the scientific consequences of lunar and planetary probes.

At any rate, since then, it has become very plain that planetary exploration is close enough to realization that tangible plans must be made for it, and I have been particularly exercised at the possibility that irreparable harm might be done before our biological colleagues woke up to this and attempted to exert some influence. I have in mind the quite tangible possibility of contamination by terrestrial organisms of the surfaces of Mars and Venus, unless stringent precautions are taken to sterilize any vehicles sent there. Recent spectroscopic observations make it quite likely that the dark spots on Mars correspond to C-H and C-H-O compounds, and their waxing and waning would almost decisively incriminate organic activity. We know practically nothing about Venus, and can certainly not exclude it as a possible habitat for some terrestrial bacteria (I was impressed on this score by seeing the flourishing growth of blue-green algae in the water at the nuclear reactor at Trombay, near Bombay!) Finally the moon might offer an ultimate test for the (possibly farfetched) proposals of interplanetary even interstellar transport of spores (Arrhenius' panspermia).

During the past year, some colleagues and I have made some headway in pointing out the dangers of uncontrolled contamination to our own (until now rather disorganized) authorities involved in deep space probes, and I feel that a reasonable mobilization of informed biological opinion could be decisive in guiding American space policy. But this really has to be done on an international basis, not only to impress our own physicist colleagues who still dominate the program, but of course especially those in other countries namely the USSR. In fact, the likelihood that any domestic proposals might be futile in view of the spectacular advances of the Russian program has most nearly discouraged my own colleagues from devoting their energy to the problem. A serious problem has been to identify those Russian scientists who could reasonably communicate their understanding of the basic problems of cosmic biology -- it is rather discouraging to face a suspected vacuum behind an iron curtain. At any rate, not a word has come out of the Soviet Union to suggest any concern on their part for the preservation of planetary surfaces against contamination, a ~~negative~~ negative caution that must, of course, be followed promptly by constructive proposals for the safe detection of planetary life.

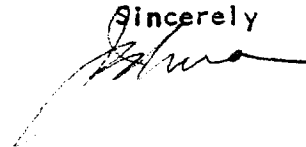
The moon as you know is already a tempting target, and it seems quite likely it will be effectively bombarded if not by the USSR then by the US in 1959 or 1960. Venus will traverse a favorable synodic period in June 1959 and strong recommendations have already been published for a shot at it then. We are certainly dealing in a time scale of weeks or months for the moon, and months or a few years for the planets.

If you still credit the proposals you and Oparin made for the mechanism of the origin of life (during the '20s) I know you will not be disinterested in these problems-- and I will be rather surprised if you did not publish the same cautions 20 years ago. I concede that there are many even more vexatious problems of terrestrial contamination of no less concern. However I look forward to any constructive suggestions you may have for coping with the challenge of planetary biology (both at scientific and political levels) and also that you will make your own voice heard to good effect on both sides of the Iron Curtain.

If you are interested I can send you copies of some of my own informal notes and minutes. You will also have received a copy of a paper called ~~XXXXXX~~ Moondust which was published in Science, June 27 '58.

Our best regards to Helen and to Rani Mahalanobis,

Sincerely



P.S. By the way, I have an Indian student with me now-- A.T. Ganesan who is as bright and promising as can be. He will doubtless rejoin Swaminathan's group at New Delhi after he finishes his Ph.D. here. You should keep an eye on him!